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**Amendment and Response**

Serial No.: 10/623,359

Confirmation No.: 5048

Filed: 18 July 2003

For: BIOMEDICAL ELECTRODE WITH CURRENT SPREADING LAYER

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**Amendments to the Claims**

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. (Currently Amended) A biomedical electrode comprising:  
a conductive polymeric sheet comprising an upper side and a lower side;  
a conductive undercoating attached to the lower side of the conductive polymeric sheet;  
an electrolyte layer attached to the conductive undercoating, wherein the conductive undercoating is located between the electrolyte layer and the lower side of the conductive polymeric sheet;  
a current spreading layer attached to the upper side of the conductive polymeric sheet, wherein the current spreading layer comprises a metallic layer on the upper side of the conductive polymeric sheet, and wherein the biomedical electrode is free of adhesive between the metallic layer and the conductive polymeric sheet; and  
an electrical connector attached to the biomedical electrode, the electrical connector in electrical communication with the conductive polymeric sheet through the current spreading layer.
2. (Original) A biomedical electrode according to claim 1, wherein the metallic layer exhibits a bulk conductivity that is greater than a bulk conductivity of the conductive polymeric sheet.
3. (Canceled)
4. (Original) A biomedical electrode according to claim 1, wherein the metallic layer consists essentially of one or more metals.

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5. (Original) A biomedical electrode according to claim 1, wherein the metallic layer comprises an electrically conductive ink.
6. (Original) A biomedical electrode according to claim 1, wherein the current spreading layer is coextensive with the upper side of the conductive polymeric sheet.
7. (Original) A biomedical electrode according to claim 1, wherein the current spreading layer comprises a pattern that comprises one or more voids, wherein a portion of the upper side of the conductive polymeric sheet is free of the metallic layer within the one or more voids.
8. (Original) A biomedical electrode according to claim 1, wherein the current spreading layer comprises a moisture barrier between the electrical connector and the electrolyte layer.
9. (Original) A biomedical electrode according to claim 1, wherein the conductive undercoating comprises a substantially non-polarizable interface with the electrolyte layer.
10. (Original) A biomedical electrode according to claim 1, wherein the conductive polymeric sheet comprises electrically conductive particles dispersed in a polymeric matrix.
11. (Original) A biomedical electrode according to claim 1, wherein the electrolyte layer comprises ionically conductive hydrogel pressure sensitive adhesive.
12. (Original) A biomedical electrode according to claim 1, further comprising an electrically conductive adhesive tape, wherein the electrically conductive adhesive tape attaches the electrical connector to the current spreading layer.

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13. (Original) A biomedical electrode according to claim 12, wherein at least a portion of the electrically conductive adhesive tape is located between the electrical connector and the current spreading layer.

14. (Currently Amended) A biomedical electrode comprising:

a conductive polymeric sheet comprising an upper side and a lower side;  
a conductive undercoating attached to the lower side of the conductive polymeric sheet;  
an electrolyte layer attached to the conductive undercoating, wherein the conductive undercoating is located between the electrolyte layer and the lower side of the conductive polymeric sheet;

a current spreading layer attached to the upper side of the conductive polymeric sheet, wherein the current spreading layer comprises a pattern that comprises one or more voids, wherein a portion of the upper side of the conductive polymeric sheet is free of the current spreading layer within the one or more voids, and wherein the biomedical electrode is free of adhesive between the current spreading layer and the conductive polymeric sheet; and

an electrical connector attached to the biomedical electrode, the electrical connector in electrical communication with the conductive polymeric sheet through the current spreading layer.

15. (Canceled)

16. (Original) A biomedical electrode according to claim 14, wherein the current spreading layer exhibits a bulk conductivity that is greater than a bulk conductivity of the conductive polymeric sheet.

17. (Original) A biomedical electrode according to claim 14, wherein the current spreading layer is coextensive with the upper side of the conductive polymeric sheet.

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18. (Original) A biomedical electrode according to claim 14, wherein the current spreading layer consists essentially of one or more metals.

19. (Original) A biomedical electrode according to claim 14, wherein the current spreading layer comprises an electrically conductive ink.

20. (Original) A biomedical electrode according to claim 14, wherein the conductive undercoating comprises a substantially non-polarizable interface with the electrolyte layer.

21. (Original) A biomedical electrode according to claim 14, wherein the conductive polymeric sheet comprises electrically conductive particles dispersed in a polymeric matrix.

22. (Original) A biomedical electrode according to claim 14, wherein the electrolyte layer comprises ionically conductive hydrogel pressure sensitive adhesive.

23. (Currently Amended) A method of manufacturing a biomedical electrode, the method comprising:

providing a conductive polymeric sheet comprising an upper side and a lower side;  
attaching a conductive undercoating to a lower side of a conductive polymeric sheet;  
attaching an electrolyte layer to the conductive undercoating, wherein the conductive undercoating is located between the electrolyte layer and the lower side of the conductive polymeric sheet;

providing a current spreading layer on the upper side of the conductive polymeric sheet, wherein the current spreading layer comprises a metallic layer on the upper side of the conductive polymeric sheet, and wherein the biomedical electrode is free of adhesive between the metallic layer and the conductive polymeric sheet; and

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attaching an electrical connector to the biomedical electrode, the electrical connector in electrical communication with the conductive polymeric sheet through the current spreading layer.

24. (Original) A method according to claim 23, wherein the metallic layer exhibits a bulk conductivity that is greater than a bulk conductivity of the conductive polymeric sheet.

25. (Canceled)

26. (Original) A method according to claim 23, wherein the metallic layer consists essentially of one or more metals.

27. (Original) A method according to claim 23, wherein the metallic layer comprises an electrically conductive ink.

28. (Original) A method according to claim 23, wherein the current spreading layer is coextensive with the upper side of the conductive polymeric sheet.

29. (Original) A method according to claim 23, wherein the current spreading layer comprises a pattern that comprises one or more voids, wherein a portion of the upper side of the conductive polymeric sheet is free of the metallic layer within the one or more voids.

30. (Currently Amended) A method of manufacturing a biomedical electrode, the method comprising:

providing a conductive polymeric sheet comprising an upper side and a lower side;  
attaching a conductive undercoating to a lower side of a conductive polymeric sheet;

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attaching an electrolyte layer to the conductive undercoating, wherein the conductive undercoating is located between the electrolyte layer and the lower side of the conductive polymeric sheet;

providing a current spreading layer on an upper side of the conductive polymeric sheet, wherein the current spreading layer comprises a pattern that comprises one or more voids, wherein a portion of the upper side of the conductive polymeric sheet is free of the current spreading layer within the one or more voids, and wherein the biomedical electrode is free of adhesive between the current spreading layer and the conductive polymeric sheet; and

attaching an electrical connector to the biomedical electrode, the electrical connector in electrical communication with the conductive polymeric sheet through the current spreading layer.

31. (Original) A method according to claim 30, wherein the current spreading layer exhibits a bulk conductivity that is greater than a bulk conductivity of the conductive polymeric sheet.

32. (Canceled)

33. (Original) A method according to claim 30, wherein the current spreading layer consists essentially of one or more metals.

34. (Original) A method according to claim 30, wherein the current spreading layer comprises an electrically conductive ink.

35. (Original) A method according to claim 30, wherein the current spreading layer is coextensive with the upper side of the conductive polymeric sheet.